REMARKS

The foregoing amendments and these remarks are in response to the Office Action dated November 20, 2009. Applicants hereby request a three month extension of time for filing this response. Authorization is given to charge the appropriate fees to Deposit Account No. 50-0951.

At the time of the Office Action, claims 61-78 were pending in the application, with claims 1-60 having been cancelled. In the Office Action, objections were raised to the specification and drawings. In addition, Claims 61-78 were rejected under 35 U.S.C. §103(a). The objections and rejections are discussed in more detail below.

I. Rejected to the specification

The specification was rejected under 35 U.S.C. §112, first paragraph as being replete with terms that are not clear, concise and exact. Applicant respectfully disagrees with the Examiner's assessment, but has nevertheless amended the specification herein to make it clearer that for Figs. 24-32 the description relates to steps/functions performed. The figures show, for example, the loopback functions when requests and responses are performed, the sources and destinations of instructions, etc. At paragraph [0089], lines 9-13 of the instant application, it is specified that the "client-service module" is "further called CNAPT (client network address and port translator)" and the "server-service module" is "further called SNAPT (server network address and port translator)" In figure 25, the wording "Client NAPT" (in the middle of the mobile device block of the figure) and "Server NAPT" (in the middle of the mobile device block) clearly represent, respectively, a CNAPT module and a SNAPT module. The description itemizes which requests, responses and instructions are being carried out at that time by the illustrated modules. It is believed that this is clear, properly illustrated and in conformance with 35 U.S.C. §112, first paragraph. Withdrawal of the rejection is thus respectfully requested.

II. Objections to the drawings

The drawings were objected to under 37 CFR §1.121(d) because they were not of sufficient quality to permit examination. In addition, the drawings were objected to under 37 CFR §1.83(a) because they were alleged to fail to show every feature of the invention. Figures 1-4 and 35-36 were also required to be labeled by a legend such as --Prior Art--. Finally, Fig. 36 was objected to

because it was duplicated on pages 32 and 33. Replacement drawings are enclosed herewith to overcome these objections, and withdrawal thereof is thus respectfully requested.

III. Rejections based on cited art:

Claims 61, 62 and 69-73 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2005/0176429 to Lee et al ("*Lee*"). Claims 63-66, 74, 76, 77 and 78 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view of admitted prior art state on page 5, lines 13-34 of the instant application and further in view of U.S. Patent Publication No. 2005/0012380 to Buddhikot et al ("*Buddhikot*"). Claims 67 and 75 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Lee* in view of admitted prior art state on page 5, lines 13-34 of the instant application and further in view of U.S. Patent No. 7,302,256 to O'Hara, Jr. et al ("*O'Hara*"). Claim 68 was rejected under 35 U.S.C. §103(a) as being unpatentable over *Lee* in view of admitted prior art state on page 5, lines 13-34 of the instant application and further in view of U.S. Patent No. 7,299,282 to Sarkissian et al ("*Sarkissian*").

The Office Action asserts that *Lee* discloses the steps of claim 61 while it fails to disclose "how each data unit is traversed to the next node." The Office Action also asserts that the admitted prior art described at page 5, lines 13-14 of the instant application describes data encapsulation, explaining "how data unit is traversed from one node to the next."

In response to this rejection, applicant has amended claim 61 herein, which is reprinted below with the steps labeled as a, b, and c for convenience. Support for this amendment may be found at least in lines 12-15 of paragraph [0045] of the published application.

> 61. (Currently amended) A method for seamless handover of mobile devices in heterogeneous networks in which method a mobile device or the mobile network to which it belongs is moved between different topological ~~network~~ locations and transmits and/or receives data by means of one or more network access technologies without the data transfer between at least one OSI Layer 7 Client IP application, running on the mobile device, and at least one OSI Layer 7 Server IP application, running on an Internet server, being interrupted, the method comprising the steps of:
>
> a) requesting, by the at least one Client IP application, the sending of one or more first data units to an OSI Layer 7 client-service module, the one or more first data units containing a client payload and a first set of headers and/or footers for each OSI Layer traversed to reach the client-service module;
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> b) creating, by the client-service module, one or more second data units and sends it or them to at least one OSI Layer 7 server-service module, the one or

more second data units containing the client payload of the first data units and a second set of headers and/or footers for each OSI Layer traversed to reach the at least one server-service module; and

b) creating, by the at least one server-service module, one or more third data units and sends it or them to the at least one Server IP application, the one or more third data units containing only the client payload and a third set of headers and/or footers for each OSI Layer traversed to reach the at least one Server IP application.

Amended claim 61 is new and inventive for at least the following reasons.

Lee relates to a method for managing mobility of mobile nodes between heterogeneous networks, in which method the movement of a mobile node between networks is supported by a mapping table and a neighbor graph. More particularly, (see paragraph [0053], fig 9) *Lee* discloses a method of managing mobility of a plurality of mobile nodes between heterogeneous networks in an IP based mobile communications system including a plurality of access nodes providing IP services to mobile nodes located in their coverage areas and a server ("the Neighbor Graph Server"), for supporting connection to the access nodes by the mobile nodes. The method comprises the steps of: classifying the access nodes according to an available service level; generating service level contexts containing access nodes with the same service level; and finally performing handoff using the context corresponding to the service level required by a mobile node during movement between the networks. Applicant respectfully disagrees with the Examiner's assertions for the following reasons.

1.) *Lee* does not disclose steps a, b and c.

The present application provides a method for seamless handover of mobile devices wherein a Client IP application sends a first data unit to a client-service module (step a), the client-service module create a second data unit and sends it to a server-service module (step b), the server-service module creates a third data unit and sends it to a Server IP application (step c) In other words, the communication between the Client Application and the Server IP application is executed by means of a middleware constituted by the client-service module and the server-service module, as explained a paragraph 0089, lines 6-10. The flow of data units is according to claim 61 is:

Client IP application → *client-service module* → *server-service module* → *Server IP application* and vice versa.

On the contrary, the server ("the Neighbor Graph Server") of *Lee* supports connection to the access nodes by mobile nodes, and it cannot be considered a middleware between the mobile nodes and the access nodes. In fact, such server only transmits a newly mapped network graph to the mobile node in order to let the mobile node communicate with a new access node but the communication is always between mobile node and access node. The flow of data in *Lee* is:

Mobile node → *access nodes* or,
Mobile node → *Neighbor Graph Server and vice versa*, as represented in figure 9 of *Lee*.

2.) Admitted prior art of page 5. lines 13-14.

The method of amended claim 61 is not based on data encapsulation as described in the above referred admitted prior art but, on the contrary, solves the limitation due to data encapsulation.

In fact, the first data unit, which is sent from the Client IP application to the client-service module, is not encapsulated in another packet, in order to be sent from the client-module to the server-module. On the contrary, only the payload of the first data is sent from the client-service module to the server-service module, together with the header and footer required for establishing a communication. As represented in figure 33 of the present application, the header and footer NH2, TH2 of the second data unit are not added to the header and footer NH1, TH1 of the first data unit but they are substituted to such header and footer NH1, TH1.

A new communication is established between the client-service module and the server-service module, at OSI Layer 7 (as specified in amended claim 61) and not a communication at a lower OSI Layer 3 which would require encapsulation of data units. Thus, as clearly recited by amended claim 61, the second data units comprises only the client payload of the first data units.

In the same way, only the payload of the second data unit is sent from the server module to the Server IP application, together with the respective header and footers. Also this communication is executed at OSI Layer 7, without encapsulation of additional header and footers.

This difference is apparent comparing the prior art of figure 36 with figure 33 which is referred to the instant application. In figure 36, the communication between a client application and a server application, by means of a middleware comprising a client-module and a server module, is executed at network layer (OSI Layer 3), encapsulating the data unit (NHI+THI+Payload) sent from the client application to the client-module into a data unit (NH2+NHI+THI+Payload) to be sent from the client-module to the server module.

The effect of the difference explained in the above points 1) and 2) is that the communication between the Client IP Application and the Server IP Application through the middleware constituted by the client-service module and the server-service module of the present application is independent from the network infrastructure because it is executed at OSI Layer 7 (not at Network Layer 3) and is faster because no encapsulation increase the size of data to be transmitted, as explained at paragraphs [0047] and [0048] of the published application. More particularly, avoiding encapsulation results not only in reduction of costs to the transmission of data but also avoids the IP fragmentation of data units which usually arises in case of encapsulation of big size packets (i.e. packets with a size close or equal to the MTU limit defined for the network, which is typically of 1500 bytes) and that dramatically reduces the wireless connection throughput.

Thus, starting from *Lee* the technical problem to be solved is how to establish a communication between the mobile nodes and the access nodes of *Lee* which is independent from the network infrastructure and which improves the performance in the communication between the Client Application and the Server Application, in order to guarantee seamless handover when the Client Application switches the network whereto it is connected. According to the present application, the solution to the problem mentioned above is to communicate between Client IP Application and Server IP Application, by means of a client-service module and server-service module, wherein the data units transmitted among two of such devices only comprises the payload and the header and footer relative to such two devices, without the addition of header and footer corresponding to devices other than the two involved in the transmission of the data units.

A person of ordinary skill in the art, starting from *Lee* and faced with this problem would have not found any hint or teaching in the admitted prior art of the present application because the

admitted prior art describes the known method of encapsulating a first packet, sent from a client application to a client-module, in a second packet, including the entire first packet with the addition of header and footer, to be sent from the client-module to the server module, at OSI Layer 3, i.e. at network Layer. More particularly, this known method provides a solution for seamless handover implementing MobileIP as described in IETF RFC 3344 "IP Mobility Support for IPv4" and IETF RFC 3775 "Mobility Support in IPvV, and schematically represented in figure 36 of the present application.

Thus, the method disclosed in *Lee* cannot be modified to be network independent nor to improve the performance in the communication between the client and the server application, because encapsulation increases the size of the packets and can produce fragmentation of IP packets, as explained in the instant application.

Advantageously, the method of the present application is platform independent because does not requite any modification to any OSI Layer or introduce any sub-layer, and it is network infrastructure independent because it does not require any modifications of the network access nodes provided by the telecom companies; in fact the client-service module and the server-service module are OSI Layer 7 applications and are independent from the underneath network infrastructure used. Advantageously, according to the presently claimed method, the mobility handling is distributed, not centralized. It is not necessary to install the server-service module on the same network as the device providing the service requested by the user and so it can be installed in any Internet node. In this way the scalability problem is overcome by distributing the server-service module wherever an access to the Internet is available.

Advantageously, avoiding encapsulation, transmission performance is improved and IP fragmentation is avoided. In fact, not one byte is added to the original payload because the seamless handover does not require encapsulation

Buddhikot discloses a method for communicating based on MobileIP wherein a mobile network is supported by separating DHCP client and server functions from MobileNAT. In this case, a client can be used by both the MobileNAT and MobileIP clients as an integrated unified mobility client (see Fig. 13 and paragraph 144).

O'Hara discloses wireless discovery mechanism facilitating the deployment and configuration of managed access elements in a wireless network. *Sarkissian* discloses a system for network monitoring and packet inspection.

Thus, none of the cited documents provide a solution for seamless handover among heterogeneous networks with access technology switching capability in which a mobile node can decide autonomously, and without any network or central assistance, when it can change its connection and to which access node it can connect.

The subject-matter of independent claims 61 and 72 (which has been amended in line with the amendments presented to claim 61) should thus be regarded as new and inventive over the cited prior art. The above arguments also apply to the dependent claims 62-71 and 73-78, which are believed patentable because of their dependence upon an allowable base claim, and because of the further features recited. Issuance of a Notice of Allowance is thus respectfully requested.

IV. Conclusion

Applicant has made every effort to present claims which distinguish over the prior art, and it is thus believed that all claims are in condition for allowance. Nevertheless, Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. In view of the foregoing remarks, Applicant respectfully requests reconsideration and prompt allowance of the pending claims.

Respectfully submitted,

Dated: 5/20/09

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